



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/878,556	06/11/2001	S. Sundar Kumar Iyer	FIS9-2000-0372-US1	3210

7590 11/29/2005

Philmore H. Colburn II
Cantor Colburn LLP
55 Griffin Road South
Bloomfield, CT 06002

EXAMINER

CHEN, JACK S J

ART UNIT	PAPER NUMBER
----------	--------------

2813

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

8V

Office Action Summary	Application No. 09/878,556	Applicant(s) IYER ET AL.	
	Examiner Jack Chen	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2005.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6-21 and 23 is/are pending in the application.
 4a) Of the above claim(s) 2, 3, 13, 14, 16, 19-21 and 23 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1, 6-12, 15, 17-18 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

In response to the communications dated September 12, 2005, claims 1, 6-12, 15 and 17-18 are active in this application.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 8-10, 15, 17-18 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wu et al., U.S./6,013,557.

Wu et al. disclose a method for forming oxide layers of varying thicknesses across a semiconductor substrate surface, which comprises patterning and blocking a semiconductor substrate 22 surface with a photoresist material layer 24 (i.e., fig. 1); removing a portion of the photoresist material layer to expose a device isolated region on a blocked semiconductor substrate surface (fig. 1); increasing a differential oxidation rate value of an exposed semiconductor substrate surface comprising converting the exposed semiconductor substrate material from a non-porous silicon material to a porous silicon material 36 (i.e., this is done by implanting helium, fig. 1); removing the photoresist material layer (fig. 2); forming (oxidation/deposition, i.e., oxidizing the substrate to deposit the oxide on the substrate) an oxide material 42/44 on the semiconductor substrate; said oxide layer 42 having a first thickness on the

Art Unit: 2813

exposed semiconductor substrate; and said oxide layer 44 having a second thickness on the blocked semiconductor substrate surface (fig. 3), wherein the first thickness is greater than the second thickness, see figs. 1-16 and cols. 1-10 for more details.

Note: the term "oxidation" is specific/narrower and the term "deposition" is broader in scope. Further in this regard, oxidation is inherently a depositing step.

If it is thought that the oxidation and deposition are two different distinct processes, then the following rejection will take place:

It is also well known in the semiconductor art to form an oxide layer by either oxidation or deposition (i.e., CVD). Furthermore, the specification contains no disclosure of either the critical nature of the claimed process (i.e. forming the oxide layer by deposition) or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen limitations or upon another variable recited in a claim, the Applicant must show that the chosen limitations are critical. *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to using either oxidation or deposition (i.e. CVD) method for forming the oxide layer. Furthermore, forming the oxide layer by either oxidation or deposition will produce the same result as noted in applicant's specification, page 6, line 23 to page 7, line 10.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2813

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 6-7 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al., U.S./6,013,557 in view of Crowder et al., U.S./6,335,262 B1 or Cho, U.S./6,143,669.

Wu et al. disclosed above; however, Wu et al. are silent to forming STI.

Crowder et al. teach a method for forming a semiconductor device, which includes forming STI, see fig. 1. Cho also teaches a method for forming a semiconductor device, which includes forming STI, see col. 2, lines 60-65.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further forming STI for separating the adjacent devices as taught by Cho or Crowder et al. in the method of Wu et al. in order to achieve a planar surface.

It is also well known in the semiconductor art to form an oxide layer by either oxidation or CVD. Furthermore, the specification contains no disclosure of either the critical nature of the claimed process (i.e. forming the oxide layer by CVD) or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen limitations or upon

another variable recited in a claim, the Applicant must show that the chosen limitations are critical. *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990).

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Wu et al. by selecting the suitable temperature range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Response to Arguments

6. Applicant's arguments filed September 12, 2005 have been fully considered but they are not persuasive.

It appears that applicant argues that the oxidation and depositing are two different processes. The Examiner disagrees because the term "oxidation" is inherently a depositing step, such as oxidizing the silicon surface to deposit the oxide thereon. Moreover, applicant fails to provide any evidences as to why the chosen limitations (i.e., depositing vs. oxidation) are critical. Further in this regard, the method for forming the oxide layer by either oxidation or depositing technique appears to produce the same result as noted in applicant's specification, page 6, line 23 to page 7, line 10.

Conclusion


7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Chen whose telephone number is (571)272-1689. The examiner can normally be reached on Monday-Friday (9:00am-6:30pm) alternate Monday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead can be reached on (571)272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jack Chen
Primary Examiner
Art Unit 2813